

WHAT IS CLAIMED IS:

1           1. A method for detecting speech activity for a signal, the method  
2 comprising the steps of:

3                   extracting a plurality of features from the signal;

4                   modeling a first and a second probability density functions (PDFs) of the  
5 plurality of features, wherein:

6                           the first PDF models active speech conditions for the signal, and

7                           the second PDF models inactive speech conditions for the signal;

8                           adapting the first and second PDFs to respond to changes in the signal over  
9 time;

10                           probability-based classifying of the signal based, at least in part, on the  
11 plurality of features; and

12                           distinguishing speech in the signal based, at least in part, upon the probability-  
13 based classifying step.

1           2. The method for detecting speech activity for the signal as recited in  
claim 1, wherein the probability-based classifying step uses the first and second PDFs.

1           3. The method for detecting speech activity for the signal as recited in  
claim 1, wherein the modeling step comprises a step of determining a mathematical model for  
the signal from the plurality of features.

1           4. The method for detecting speech activity for the signal as recited in  
claim 1, wherein the adapting step comprises a step of increasing a likelihood.

1           5. The method for detecting speech activity for the signal as recited in  
claim 1, wherein the adapting step comprises a step of identifying extreme values in a long  
sequence of previous frames.

1           6. The method for detecting speech activity for the signal as recited in  
claim 1, wherein the probability-based classifying step comprises a step of classifying based  
on likelihood ratio detection.

1                   7.        The method for detecting speech activity for the signal as recited in  
2 claim 1, wherein the probability-based classifying step comprises applying a log-likelihood  
3 ratio test to one of the plurality of features.

1                   8.        The method for detecting speech activity for the signal as recited in  
2 claim 1, wherein at least one of the first and second PDFs comprises a Gaussian mixture  
3 model.

1                   9.        The method for detecting speech activity for the signal as recited in  
2 claim 1, wherein at least one of the first and second PDFs uses a non-Gaussian model.

1                   10.      The method for detecting speech activity for the signal as recited in  
2 claim 1, wherein at least one of the first and second PDFs comprises a plurality of basic  
3 density models.

1                   11.      The method for detecting speech activity for the signal as recited in  
2 claim 1, wherein at least one of the plurality of features is related to power in a spectral band  
3 of the signal.

1                   12.      The method for detecting speech activity for the signal as recited in  
2 claim 1, further comprising a step of smoothing an activity decision for hangover periods to  
3 produce a smoothed activity decision.

1                   13.      A computer-readable medium having computer-executable instructions  
2 for performing the computer-implementable method for detecting speech activity for the  
3 signal of claim 1.

1                   14.      A method for detecting sound activity for a signal, the method  
2 comprising the steps of:  
3                   extracting a plurality of features from the signal;  
4                   modeling an active speech probability density function (PDF) of the plurality  
5 of features;  
6                   modeling an inactive speech PDF of the plurality of features;  
7                   adapting the active and inactive speech PDFs to respond to changes in the  
8 signal over time;

9 probability-based classifying of the signal based, at least in part, on the  
10 plurality of features; and  
11 distinguishing speech in the signal based, at least in part, upon the probability-  
12 based classifying step.

1 15. The method for detecting sound activity for the signal as recited in  
2 claim 14, wherein the probability-based classifying step uses the active and inactive speech  
3 PDFs.

1 16. The method for detecting sound activity for the signal as recited in  
2 claim 14, wherein the adapting step comprises a step of increasing a likelihood.

1 17. The method for detecting sound activity for the signal as recited in  
2 claim 14, wherein at least one of the active and inactive speech PDFs uses a non-Gaussian  
3 model.

1 18. A computer-readable medium having computer-executable instructions  
2 for performing the computer-implementable method for detecting sound activity for the  
3 signal of claim 14.

1 19. A method for detecting sound activity for a signal, the method  
2 comprising the steps of:

3 extracting a plurality of features from the signal;

4 modeling an active speech probability density function (PDF) of the plurality  
5 of features;

6 modeling an inactive speech PDF of the plurality of features, wherein at least  
7 one of the active and inactive speech PDFs uses a non-Gaussian model;

8 adapting the active and inactive speech PDFs to respond to changes in the  
9 signal over time;

10 probability-based classifying of the signal based, at least in part, the active and  
11 inactive speech PDFs; and

12 distinguishing speech in the signal based, at least in part, upon the probability-  
13 based classifying step.

1 20. The method for detecting sound activity for the signal as recited in  
2 claim 19, wherein both the active and inactive speech PDFs use a non-Gaussian model.

1           21. A computer-readable medium having computer-executable instructions  
2 for performing the computer-implementable method for detecting sound activity for the  
3 signal of claim 19.